भारतीय मानक
Indian Standard

IS 14756 : 2022

स्टेनलेस स्टील के बर्तन — विशिष्टि

(दूसरा पुनरीक्षण)

Stainless Steel Utensils — Specification

(Second Revision)

ICS 77.140.20: 97.040

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भारतीय मानक ब्यूरो
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March 2022 **Price Group 7**

Utensils, Cutlery Domestic Hardware Sectional Committee, MED 33

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Utensils, Cutlery Domestic Hardware Sectional Committee had been approved by the Mechanical Engineering Divisional Council.

This standard was first published in 2000 after superseding IS 3257 : 1980 'Stainless steel compartmental trays', IS 3258 : 1980 'Stainless steel serving utensils', IS 3411 : 1985 'Stainless steel cooking utensils' and IS 3424 : 1985 'Stainless steel table utensils' and revised in 2017.

In this revision, the following major changes have been made:

a) New raw material has been added (3 ply);
b) Dry heat test for 3 ply material has been added;
c) Provision of lid has been incorporated;
d) Marking requirements have been modified; and
e) Nominal capacity test has been added.

The shapes and sizes demanded in the country differ from area to area therefore, need not rigidly be tied down. For the general run of the utensils uses, the shapes and sizes covered in this standard are recommended.

The composition of the committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 ' Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

STAINLESS STEEL UTENSILS — SPECIFICATION

(Second Revision)

1 SCOPE

This standard lays down the minimum requirements for following types of stainless steel utensils:

a) Cooking utensil;
b) Serving utensils;
c) Table utensils, and
d) Storage utensils.

2 REFERENCES

The following standards are necessary adjuncts to this standard. This standard contains provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
21 : 1992	Wrought aluminium and aluminium alloys for manufacture of utensils — Specification (*fourth revision*)
5522 : 2014	Stainless steel sheets and strips for utensils — Specification (*third revision*)
6527 : 1995	Stainless steel wire rod — Specification (*first revision*)
6911 : 2017	Stainless steel plate, sheet and strip — Specification (*second revision*)
9040 : 1978	Methods for sampling of utensils
13395 : 2021	Performance of handles and handle assemblies attached to cookware — Specification (*first revision*)
15960 : 2013	Composite bottom stainless-steel cooking utensils — Specification
15997 : 2012	Low nickel austenitic stainless-steel sheet and strip for utensils and kitchen appliances — Specification

3 MATERIAL

3.1 The stainless steel used for manufacture of utensils shall conform to IS 5522 or IS 15997.

3.2 The material used for composite bottom shall be as per IS 15960.

3.3 If the body of the utensil is made of a 3 ply construction, 3 ply material shall be made with inner layer – designation X04Cr19Ni9 (grade 304) of IS 5522, middle layer – aluminium as per IS 21 and outer layer – designation X07Cr17 (grade 430)/X02Cr18Ti (grade 439) of IS 6911.

NOTE — Only chemical composition of stainless steel and aluminium needs to be complied with.

3.4 If the utensil is provided with stainless steel lid, the material of lid shall be as per IS 5522 or IS 15997. The minimum thickness of the lid shall be 0.4 mm.

3.5 If the utensil is provided with tempered glass lid, the lid shall conform to the performance requirements as given in **6.8**. The minimum thickness of glass shall be 3.5 mm. If the stainless steel rim is provided on the glass lid, the material of rim shall be as per IS 5522 or IS 15997. The minimum thickness of the rim shall be 0.25 mm.

4 SHAPES AND DIMENSIONS

4.1 The shapes and dimensions for various types of utensils shall be as per the agreement between the purchaser and the manufacturer. However, some of the shapes of different types of utensils are given in Annex A for guidance.

4.2 The minimum thickness of the sheet used for manufacturing of utensils shall conform to Table 1. The permissible reduction in the thickness of the finished utensils, taking into account the pressing or spinning process, shall not be more than 15 percent on the minimum sheet thickness specified as per Table 1. For fabricated utensils, 15 percent reduction in the thickness of sheet is not applicable.

Table 1 Requirement for Thickness of Sheet for Utensils

(*Clause* 4.2)

All dimensions in millimeters

Sl No.	Types of Utensils	Minimum Thickness of Sheet
(1)	(2)	(3)
i)	Cooking utensils	0.9
ii)	Serving utensils	0.7
iii)	Table utensils	0.7
iv)	Storage utensils:	
	a) Deep drawn	0.7
	b) Fabricated	0.56

NOTES

1 The thickness of 3 ply utensils is given in **4.4**.

2 The thickness of cladded cooking utensils, refer to IS 15960.

4.3 The material thickness for 2-ply and 3-ply composite bottom of stainless steel utensil shall be as per IS 15960.

4.4 The minimum thickness of 3 ply full body utensil shall be 2.5 mm

5 WORKMANSHIP AND FINISH

5.1 The utensils shall not have any sharp edges and shall be free from distortion, dents, wrinkles, burns, splinters, scratches, pitting, deep tool marks and other surface defects. The utensils generally be bright finish , matt finish or combination of both finish and shall not rock when placed on flat surface (*see* Note 1 and Note 2). In case of electrolytic copper deposition on the utensils at the bottom the coating shall be free from defects such as un-plated area and their superficial blemishes visible to the naked eye

NOTES

1 Flat bottom utensil shall not rock when placed on flat surface.

2 For curved base utensils attachment can be provided by manufacturer to make the utensils stable when placed on the flat surface or LPG gas stove.

5.2 The construction of the utensils shall be such that, it is possible to clean them thoroughly and all surfaces for cleaning are accessible by hand or brush.

5.3 Metal handles shall be fitted to the utensils by spot welding or riveting. Spot welded joints shall not have any crevices. In case of plastic handles, it shall be suitably fitted to the body through a metal bracket or ferrule fixed to the utensil by spot welding or riveting. Normally stainless steel rivets or stainless steel capped rivets are used to fix the handle(s) on utensil. Stainless steel rivets or stainless-steel capped aluminum rivets can be used to fix the handles on Utensils. The material for the stainless-steel rivets shall be as per IS 6527. The material of stainless steel cap shall be as per IS 5522.

5.4 Where handles are required, the requirements for handles shall conform to IS 13395.

5.5 In case material as per IS 15997 comes in contact with food, there shall be no welding on utensil.

5.6 After processing 3 ply utensils, there shall be no oozing of middle layer or any delamination of the layers when checked visually at the edges.

6 TESTS

6.1 Staining Test

The surface of the utensil shall be thoroughly washed with hot soapy water. Thoroughly rinse and then degrease the test specimens in acetone or methylated spirits, then wiped using a soft cloth. The utensils, when dipped for 16 h in each of the following solutions maintained at 60 °C ± 2 °C temperature, shall not show any sign of staining after removal from the solutions at the end of above period:

a) Ten gram of glacial acetic acid (99 percent) dissolved in distilled water to make 100 ml; and

b) Five gram of pure sodium chloride dissolved in distilled water to make 100 ml.

6.2 Mechanical Shock Test (for Cladded Utensils Only)

The utensil body shall be supported in air with the bottom side up and a steel ball weighing half a kilogram dropped on to it from the height of 500 mm five times. After completion of the test, the cladded or deposited layer shall show no sign of peeling off or coming off.

6.3 Thermal Shock Test (for Cladded Utensils Only)

The utensil body only shall be kept in an oven to attain a temperature of 275 °C (+ 25 °C/– 0 °C). Thereafter the utensil shall be removed and dipped immediately in water maintained at room temperature. This process shall be repeated three times and at the end of the process the deposited layer/cladding shall not show any sign of peeling off or coming off.

6.4 Dry Heat Test (for Cladded Utensils Only)

The utensil body only shall be heated upto 250 °C (+ 25 °C/– 0 °C) on induction and immediately quench in water (water temperature before quenching shall be around 35 °C ± 5 °C). Repeat the cycle for 25 times on induction and repeat the cycle for 25 times on gas. Check the bottom for bulge, separation of disc or blisters after cooling every cycle. There shall be no separation of cowl or disc from the utensil after cooling.

6.5 Coating Thickness Test (for Copper Deposit)

The total thickness of the utensil including copper deposit shall be measured. The copper deposit shall then be stripped off in two areas of required size. The thickness of the stainless steel sheet shall then be measured. The difference between the total thickness including copper deposited and the thickness of stainless-steel sheet be considered as the thickness of the copper deposited. This test is for electro deposition of copper only.

6.6 For 3 ply construction utensil body, the body shall be tested as per **6.6.1**. The body shall not show any separation (or delamination) of the 3-ply or shall not show blisters, after the completion of 50 heat cycles.

6.6.1 Heat the utensil body to 250 °C (+ 25 °C/– 0 °C) and quench in water at ambient temperature. Before quenching, the utensil body shall be checked at a minimum of two locations to confirm, that the temperature of the utensil body has attained 250 °C (+ 25 °C/– 0 °C). Temperature to be measured at inside bottom and top edge (mouth portion) of the utensil (record the temperature for atleast the first and the last cycle). Repeat this cycle 50 times.

NOTES

1 Hold (soak) the utensil body for 2 min at 250 °C (+ 25 °C/– 0 °C) under heating condition, before measuring and subsequent quenching in ambient temperature water.

2 For guidance purpose, heating source may be hot air oven or any other equipment which can be used to achieve such temperature

6.7 Nominal Capacity Test

6.7.1 The nominal capacity of cookware shall be expressed only in complete or 100 ml units. No negative tolerances shall be allowed on the nominal capacity.

NOTE — If the capacity of a utensil is not in complete or half-Litre unit, its nominal capacity shall be marked as the nearest lower complete or 100 ml units. For example, in the case of a utensil having a capacity of 3.95 Litre, the nominal capacity to be marked shall be 3.9 Litre.

6.7.2 In case the marking or labeling is in terms of diameter, the internal diameter of utensil shall be marked (except for tawa, where the diameter is outer diameter). The dimensions shall be exclusive of the handles. The diameter shall be expressed only in complete or 1.0 cm units. No negative tolerances shall be allowed on the diameter.

NOTE — If the diameter is 39.2 cm, its diameter shall be marked as the nearest lower complete of 1.0 cm units, the diameter to be marked 39 cm.

6.8 Test(s) on Tempered Glass Lid

6.8.1 *Fragmentation Test*

6.8.1.1 One lid from each lot having the same thickness is to be tested for this purpose. The sample lid shall be supported on a level surface (vitrified tile or smooth concrete surface). Paste a 50 mm × 50 mm transparent tape inside the glass lid, where the glass would be impacted. The glass lid shall be broken by means of a center punch having radius of curvature 0.20 mm ± 0.05 mm at its tip by giving one severe blow to cause fracture. The point can be center point between the outer edge and the center (away from a hole, if provided).

6.8.1.2 The particle count determination shall be completed within 3 min of the fracture of that glass. No magnifying lens or other aid to vision need be used when making the particle count. The broken particle in a square of side 50 mm shall be counted. There shall be not less than 60 particles in a square of side 50 mm (50 mm × 50 mm). Biggest grain size shall not be more than 4.2 mm

6.8.2 *Ball Drop Test*

6.8.2.1 One lid from each lot having the same thickness is to be tested for this purpose. The specimen shall be supported on a level surface (vitrified tile or smooth concrete surface). Mark three points 120 degree apart, the point can be center point between the outer edge and the center, (away from a hole, if provided).

6.8.2.2 The smooth surface steel ball of 227 grams is placed at a height of 1 000 mm from the surface (can be inside a plastic tube with a sliding stopper). Allow the ball to free fall on the three points. No crack shall be seen by the naked eye under normal light.

6.8.3 *Thermal Shock Test*

6.8.3.1 This test is applicable for glass lids used for cooking utensils, for others this test is optional.

6.8.3.2 One lid from each lot having the same thickness is to be tested for this purpose. Place the glass in an air circulating oven at 120 °C ± 5 °C. Soak for the cited temperature for 30 min. Remove the glass, pour one liter of water at ambient temperature on the lid. The lid shall not shatter.

6.8.4 *Free Fall Test*

6.8.4.1 Drop the lid with rim facing down, from a height of 900 mm on a vitrified tile surface or a level smooth concrete surface. The glass shall not break/crack.

6.4.8.2 Drop the lid without rim facing down, from a height of 900 mm on a vitrified tile surface or a level concrete surface. The glass shall not break/crack.

7 SAMPLING

Unless agreed to between the purchaser and the manufacturer, the sampling of utensils and criteria of conformity shall be done in accordance with IS 9040 for dimensional and staining test. The tests **6.2**, **6.3**,

6.4 and **6.5** are type tests applicable to cladded utensils and shall be done on separate sample in every batch. To ensure the quality of the utensils additional tests shall be conducted on five utensils selected at random from one lot (one shift production) or 1 000 pieces, whichever is less in the order specified in Table 2.

8 MARKING

8.1 Each utensil shall have the following details:

a) Category of utensil;
b) Capacity in litre or size in cm of utensil;
c) Material of utensil;
d) Material grade;
e) Manufacturer name or initials or trade-mark; and
f) Batch number

NOTE — These details could be provided by means of stamping or engraving on each utensil or printing the packaging material or sticker.

8.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the product(s) may be marked with the Standard Mark.

9 PACKING

Each utensil shall be suitable packaged to avoid any damage during transit. The packaging shall be eco-friendly.

Table 2 Addition Tests

(*Clause* 7)

Sl No. (1)	Tests (2)	Remarks (3)
i)	Sample 1:	
	a) Mechanical shock test (*see* **6.2**)	If found OK subject to next test
	b) Thermal shock test (*see* **6.3**)	Only for electrodeposited utensils
ii)	Sample 2: Staining test (*see* **6.1**)	This test is to be carried out for every 5 000 pieces or once in a month whichever is earlier
iii)	Sample 3: Dry heat test (*see* **6.4**)	For bottom cladded 2-ply and 3-ply construction utensils
iv)	Sample 4: Dry heat test (*see* **6.6**)	For 3 ply full body utensils

ANNEX A

(*Clause* 4.1)

DIAGRAMMATIC SHAPE OF DIFFERENT TYPES OF UTENSILS

A-1 Diagrammatic shape of different types of utensils shall be as shown in Fig. 1 to Fig. 14. In these figures '*H*' is the height and '*D*' is the diameter

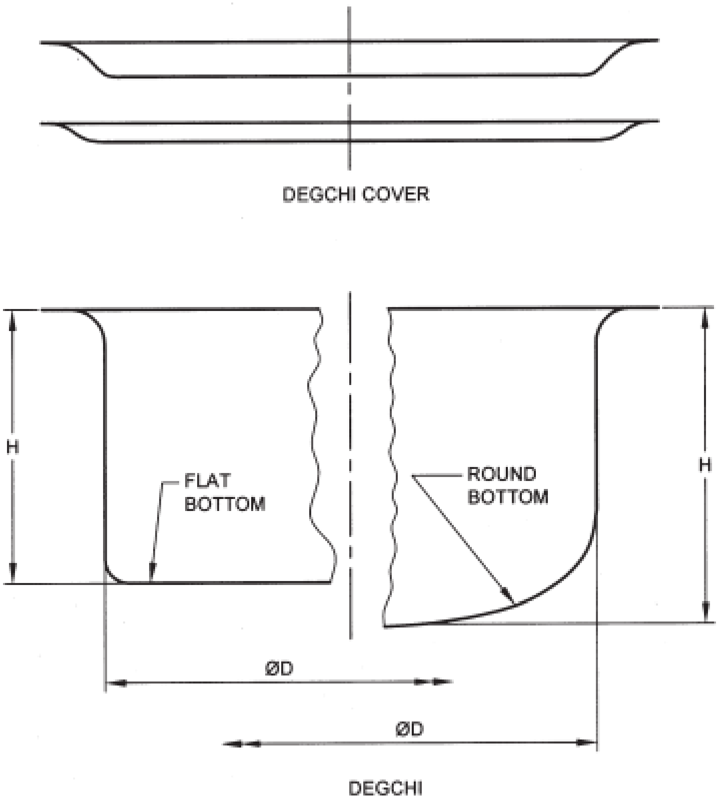

Fig. 1 Deep Degchi

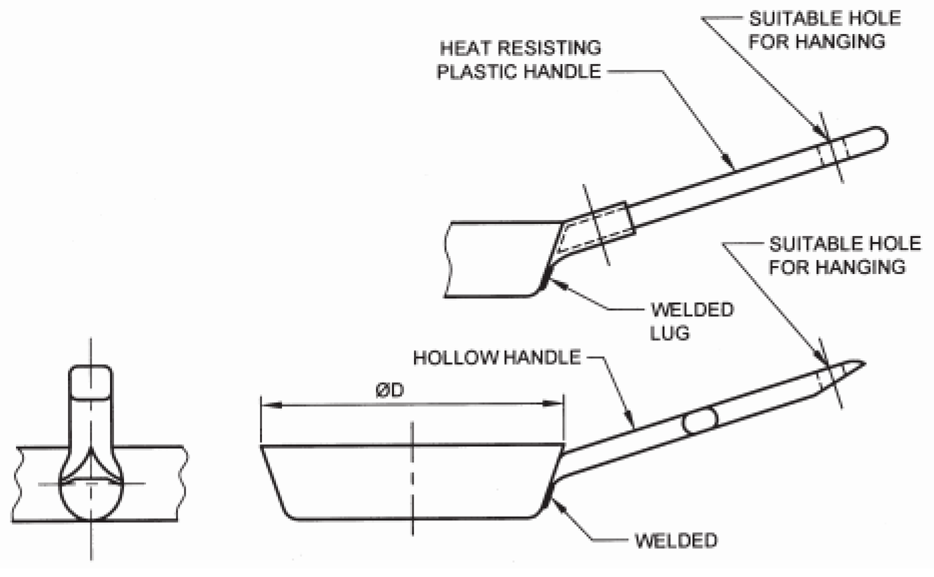
SUITABLE HOLE FOR HANGING
HEAT RESISTING PLASTIC HANDLE
SUITABLE HOLE FOR HANGING
WELDED LUG
HOLLOW HANDLE
ØD
WELDED

Fig. 2 Frying-Pan

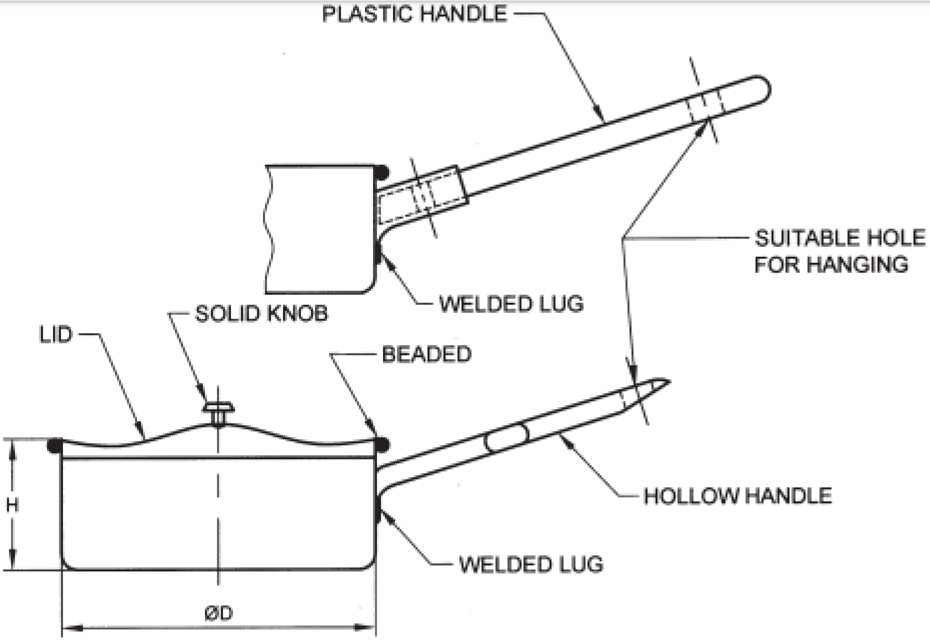

FIG. 3 SAUCEPAN

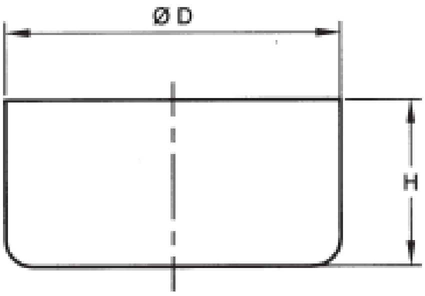

FIG. 4 KATORI

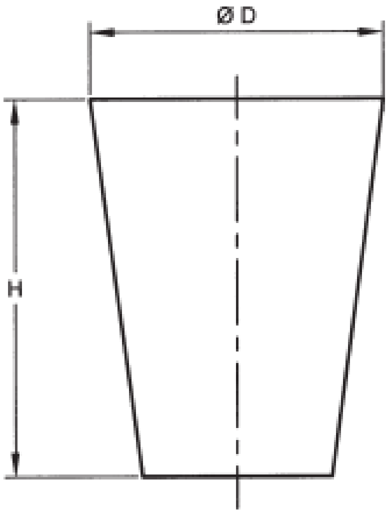

FIG. 5 TUMBLER

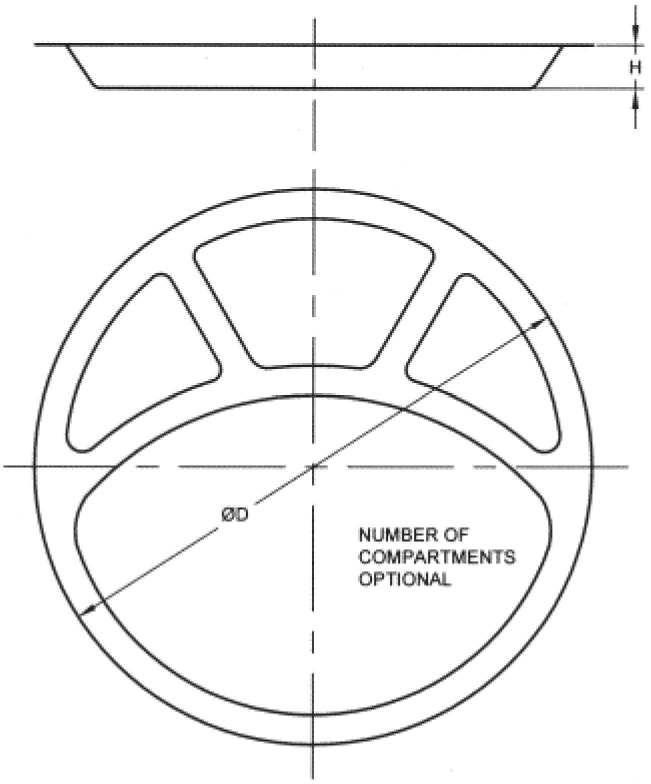

Fig. 6 Compartmental Tray, Round

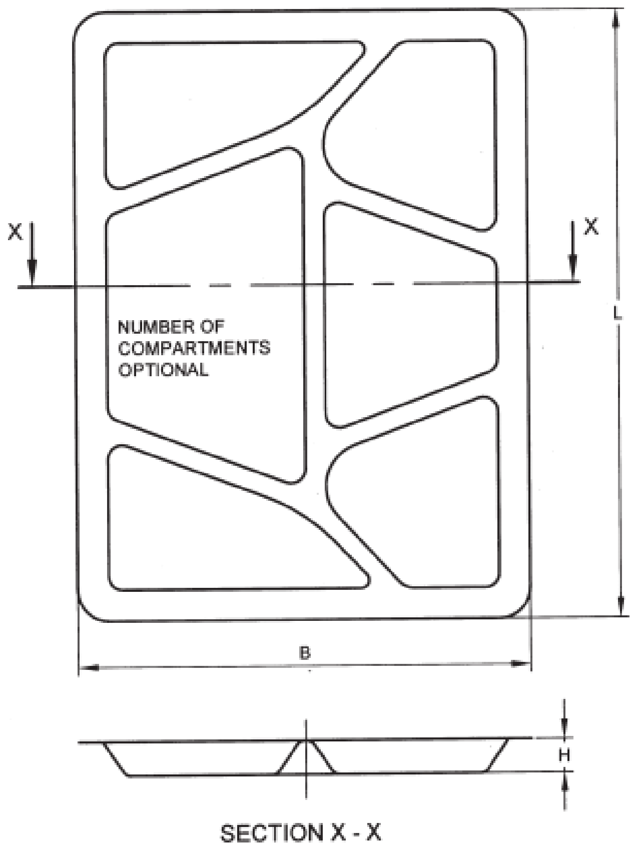

Fig. 7 Compartmental Tray, Rectangular

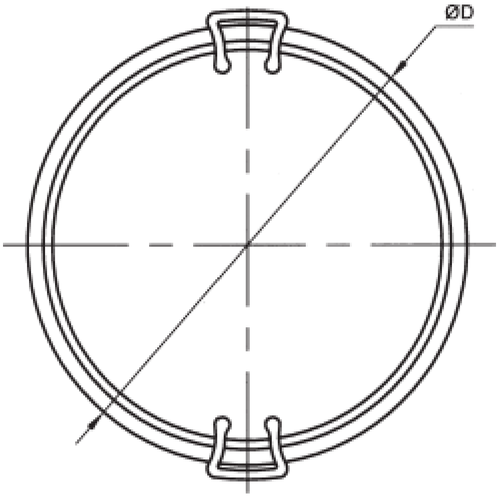

FIG. 8 ENTREE DISH, ROUND

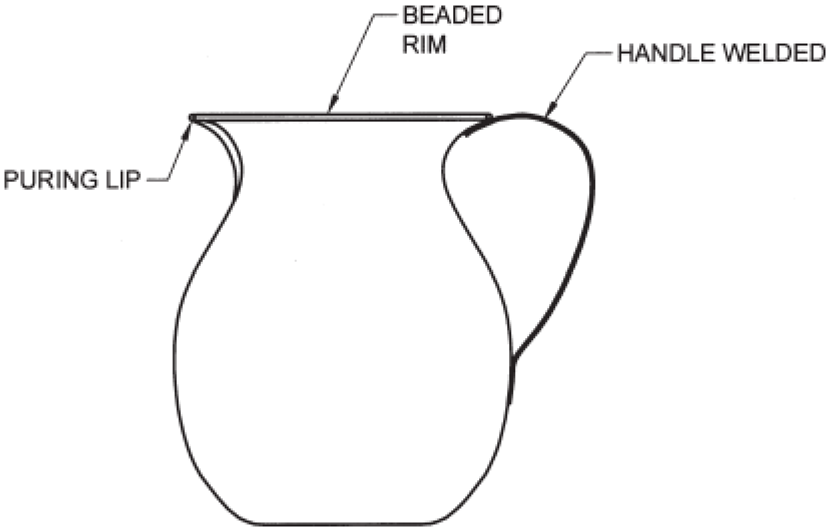

FIG. 9 JUG TYPICAL

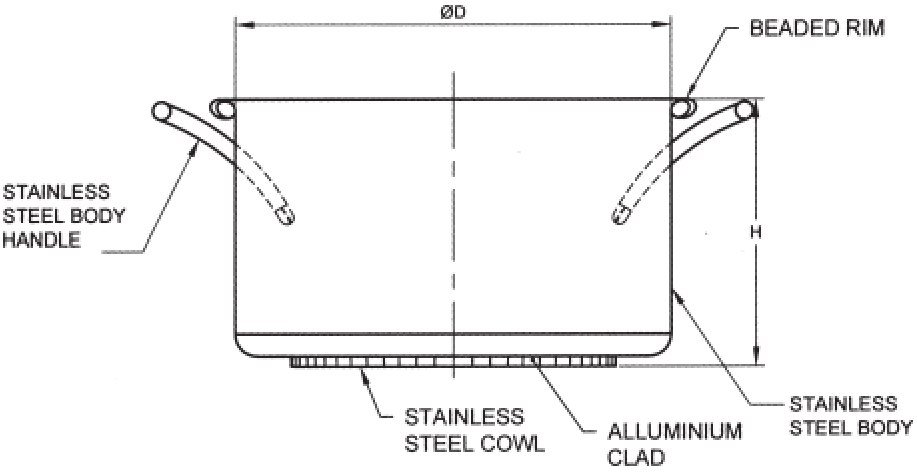

Fig. 10 Cassrole with Cladded Base

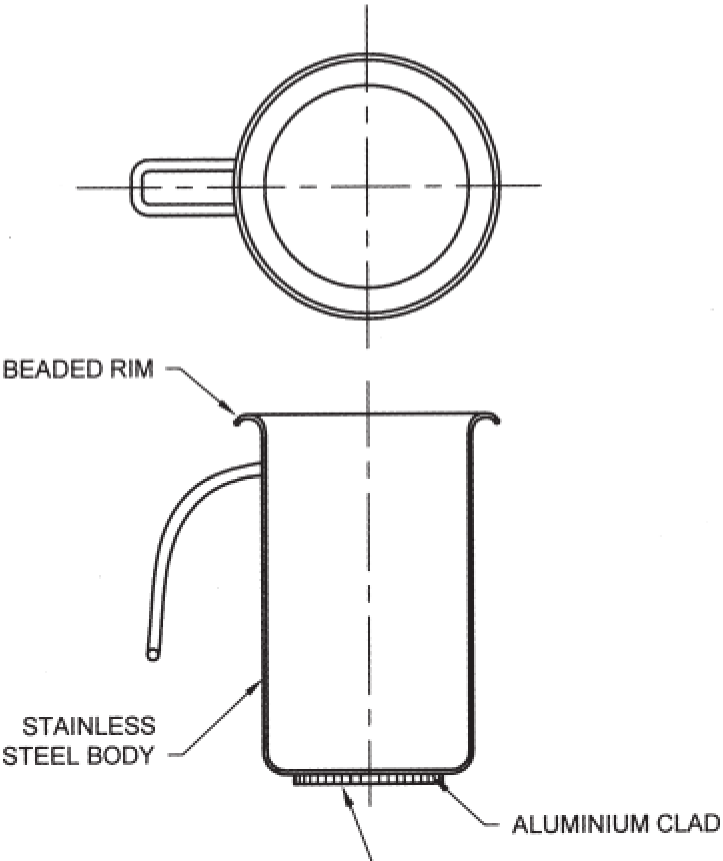

Fig. 11 Jug with Cladded Base

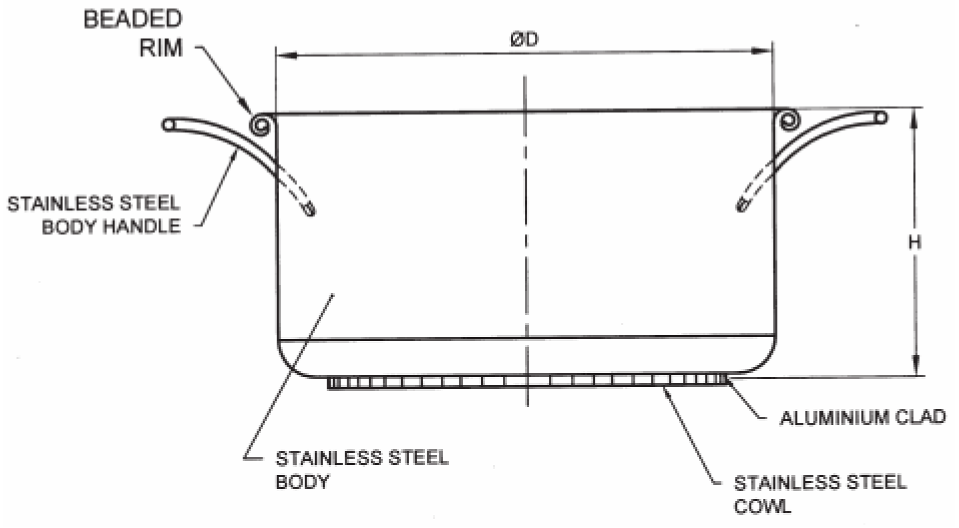

FIG. 12 DEEP POT WITH CLADDED BASE

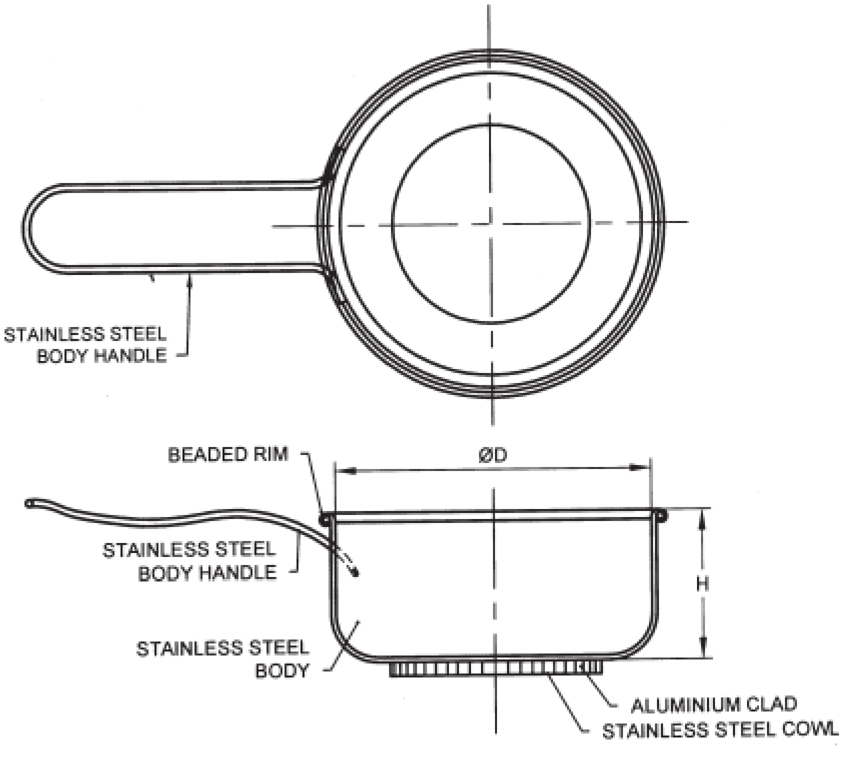

FIG. 13 FRY PAN WITH CLADDED BASE

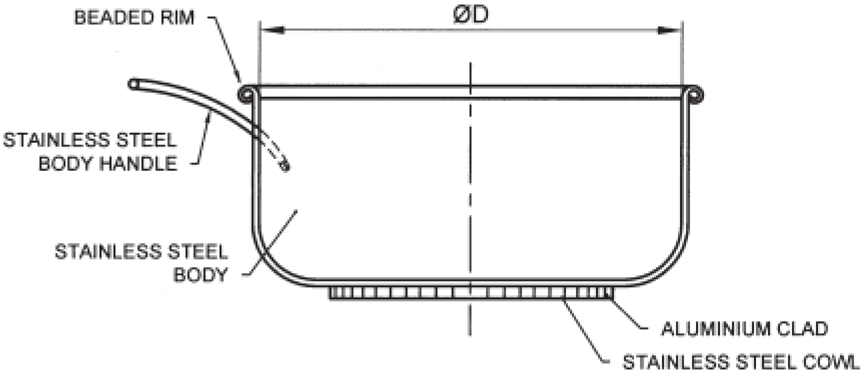

FIG. 14 SAUCE PAN WITH CLADDED BASE

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Utensils, Cutlery Domestic Hardware Sectional Committee, MED 33

Organisation	*Representative(s)*
In Personal Capacity (*A-504, K.G Chandra Vista, OMR, Opposite to Satyabhama University, Sholinganallur*), Chennai	Shri G. Shanmuganathan (***Chairman***)
Aligarh Locks Manufacturers and Traders Association, Aligarh	Shri P. L. Shiromani Shri Dhruv Mishra (*Alternate*)
Anna Aluminium Ltd, Cochin	Shri K. Chandrashekran Pillai Shri V. Thulasidharan (*Alternate*)
Butterfly Gandhimati Appliances Ltd, Chennai	Shri K. Shanmugavelu Shri A. Baskar (*Alternate* I) Shri A. Vijaimiratharaj (*Alternate* II)
Central Electrochemical Materials Science Division, Karaikudi	Dr S. Vasudevan Dr S. Muralidharan (*Alternate*)
Central Public Works Department, New Delhi	Shri Surinder Kumar Shri R. K. Saraswat (*Alternate*)
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D P Garg and Co Pvt Ltd, Noida	Shri Sandip Garg
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Hamilton Housewares Pvt Ltd, Mumbai	Shri Sanjay Moreshwar Mhatre Shri Induprakash Singh (*Alternate*) Shri Vikas Surendra Kumar Bhatia (*Young Professional*)
Hawkins Cookers Ltd, Thane	Shri B. S. Sethi Shri Rahul Pathak (*Alternate*) Shri Ravinder Mali (*Young Professional*)
Hindalco Industries Ltd, Disttt, Sonbhadra	Dr Vivek Srivastava Shrimati Manali Khandelwal (*Alternate*)
Jindal Stainless Limited, Hisar	Shri Biswabasu Roy Chowdhury Shrimati Jalaja Menon (*Alternate*)
Ministry of Defence (DGQA), Kanpur	Er M. Satyanarayana Shri S. J. Kolarkar (*Alternate*)
MSME Testing Centre, New Delhi	Shri S. V. Sharma Shri S. S. Yadav (*Alternate*)
National Metallurgical Laboratory, Jamshedpur	Dr S. Ghosh Chowdhury Dr K. L. Sahoo (*Alternate*)
Pritam Internation, Baddi	Shri Rahul Khera Shri Rohit Khera (*Alternate*)

Organisation	*Representative(s)*
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Royal Kitchen Appliances Pvt Ltd, Sonepat	Shri Suresh Agarwal
Sat Rattan Engineering Works, New Delhi	Shri G. L. Khera Shri Rahul Khera (*Alternate*)
Sriram Institute for Industrial Research, New Delhi	Dr Tarsame Singh Sian Shri Aneesh Kumar (*Alternate*)
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BIS Directorate General	Shri Rajneesh Khosla, Scientist 'E' and Head (MED) [Representing Director General (*Ex-officio*)]

Member Secretary

Shri Chandan Gupta
Scientist 'D' (MED), BIS

Bureau of Indian Standards

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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